

# SERVICE MANUAL

# NAD

## SERVICE SAFETY PRECAUTIONS (UL)

1. Use exact replacement parts for critical locations marked "⚠"
2. Return lead dress to original position and re-install protective covers.
3. Before returning to customer, test for shock hazard; use either method A or B:
  - A. Leakage test "cold":
    1. Unplug the AC cord; turn power switch ON.
    2. Connect one lead of High Voltage Insulation Tester to both prongs of the AC plug.
    3. Touch other lead to all exposed metal parts.
    4. Impedance measurement must be 0.3-5.0 Megohms.
  - B. Leakage test, "live":
    1. Plug unit directly into the AC outlet: do not use isolation transformer.
    2. Connect one lead of the Leakage Current Tester to earth ground.
    3. Touch other lead to all exposed metal parts.
    4. Leakage measurement must be less than 0.5 milliamps.

# 312

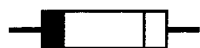
STEREO INTEGRATED  
AMPLIFIER

# 312

## STEREO INTEGRATED AMPLIFIER

# SERVICE SAFETY PRECAUTIONS

## 1. Replacing the fuses



This symbol located near the fuse indicates that the fuse used is fast operating type. For continued protection against fire hazard, replace with same type fuse. For fuse rating refer to the marking adjacent to the symbol.

| <u>Reference No</u> | <u>Part Number</u> | <u>Description</u>                       |
|---------------------|--------------------|------------------------------------------|
| F503-F504*AH        | 5120-0019-0        | Fuse 4A 125V Slow Blow LBC (UL/CSA)      |
| F503-F504*B,B1,C    | 5120-0017-0        | Fuse 4A 250V Time Lag HBC (SEMKO/VDE)    |
| F505-F506*AH        | 5120-0026-0        | Fuse 315mA 250V Time Lag LBC (UL/CSA)    |
| F505-F506*B,B1,C    | 5120-0027-0        | Fuse 315mA 250V Time Lag LBC (SEMKO/VDE) |

### NOTE :

- <\*AH > : USA, CANADIAN MODEL ONLY.
- <\*B > : UK MODEL ONLY.
- <\*B1 > : AUSTRALIAN MODEL ONLY.
- <\*C > : EUROPEAN MODEL ONLY.

## 2. Safety-check out

(Only U.S.A. model)

After correcting the original service problem perform the following safety check before releasing the set to the customer.

Connect the insulating-resistance tester between the plug of power supply cord and the screw on the back panel.

Specifications : 3.3 Mohm $\pm$ 10% at 500V.

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# SPECIFICATIONS

## POWER AMPLIFIER SECTION

|                                                                                                                                                            |                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| CONTINUOUS AVERAGE POWER<br>OUTPUT INTO 8 OHMS<br>(Min. power per channel, 20 Hz - 20 kHz, both<br>channels driven, with no more than rated<br>distortion) | <b>30 W (14.8 dBW)</b>                                     |
| Rated Distortion<br>THD (20 Hz - 20 kHz)                                                                                                                   | <b>0.03%</b>                                               |
| Clipping power<br>(Maximum continuous power per channel).                                                                                                  | <b>40 W</b>                                                |
| IHF dynamic headroom at 8 ohms                                                                                                                             | <b>+2.2 dB</b>                                             |
| IHF dynamic power<br>(Maximum short term power per channel)                                                                                                |                                                            |
| 8 ohms:                                                                                                                                                    | <b>50 W (17 dBW)</b>                                       |
| 4 ohms:                                                                                                                                                    | <b>60 W (17.8 dBW)</b>                                     |
| 2 ohms:                                                                                                                                                    | <b>75 W (18.7 dBW)</b>                                     |
| Slew rate                                                                                                                                                  | <b>&gt; 20 V / <math>\mu</math>sec</b>                     |
| Damping factor at 50Hz 8 ohms:                                                                                                                             | <b>&gt; 60</b>                                             |
| Input Impedance                                                                                                                                            | <b>R = 20 kohms<br/>C = 820 pF</b>                         |
| Input sensitivity (for rated output into 8 ohms)                                                                                                           | <b>1 V</b>                                                 |
| Voltage gain                                                                                                                                               | <b>x15.5 (23.8 dB)</b>                                     |
| Frequency response 20 Hz - 20 kHz                                                                                                                          | <b><math>\pm 0.6</math> dB<br/>- 3 dB at 3 Hz / 70 kHz</b> |
| Signal / Noise ratio, A-weighted                                                                                                                           | <b>100 dB ref. 1 W<br/>114.8 dB ref. rated power</b>       |
| THD<br>(Total Harmonic Distortion, 20 Hz - 20 kHz,<br>from 250 mW to rated output)                                                                         | <b>&lt; 0.03%</b>                                          |
| SMPTE I.M.<br>(Intermodulation Distortion, 60 Hz + 7 kHz, 4:1,<br>from 250 mW to rated output)                                                             | <b>&lt; 0.03%</b>                                          |
| IHF I.M.<br>(CCIF IM.Distortion, 19 + 20 kHz at rated output)                                                                                              | <b>&lt; 0.03%</b>                                          |

## **PREAMPLIFIER SECTION**

### **PHONO INPUT**

Input impedance (R and C)

**MM: 47 kohms + 200pF**

Input sensitivity (ref. rated power, 1 kHz)

**MM: 2.7 mV**

Input overload at 20 Hz / kHz / 20 kHz

**MM: 22 mV / 220 mV / 2.0 V**

THD (20 Hz - 20 kHz) and IM dist.

**0.03% at 20 mV input**

RIAA accuracy

**± 0.5 dB**

Signal / Noise ratio

**MM: 77 dB ref. 5 mV**

(A-weighted with cartridge connected)

### **LINE LEVEL INPUTS**

(CD, Video, Auxiliary, Tuner, Tape1, Tape2)

Input impedance (R and C)

**20 kohms + 500 pF**

Input sensitivity (ref. rated power)

**165 mV**

Maximum input signal

**12V**

Signal/ Noise ratio, A-weighted

**88 dB ref. 1 W**

**102.8 dB ref. rated power**

Frequency response, 20 Hz - 20 kHz

Tone Defeat On

**±0.3 dB**

Tone Defeat Off

**±0.6 dB**

Infrasonic filter

**-3 dB at 10Hz**

**12 dB /octave**

THD (20 Hz - 20 kHz)

**0.02%**

### **LINE LEVEL OUTPUTS**

Preamp output impedance

**220 ohms**

Tape output impedance

**Source Z + 2 kohms**

Headphones output impedance

**220 ohms**

Maximum output level

preamp-out:

**> 12 V**

tape-out:

**> 10 V**

headphones-out:

**> 10 V into 600 ohms**

**> 500 mV into 8 ohms**

### **CONTROLS**

Treble

**± 7 dB at 10 kHz**

Bass

**± 10 dB at 50 Hz**

## **DIMENSIONS AND WEIGHTS**

Net Weight

**6.9 kg (15.2 lb)**

Shipping Weight

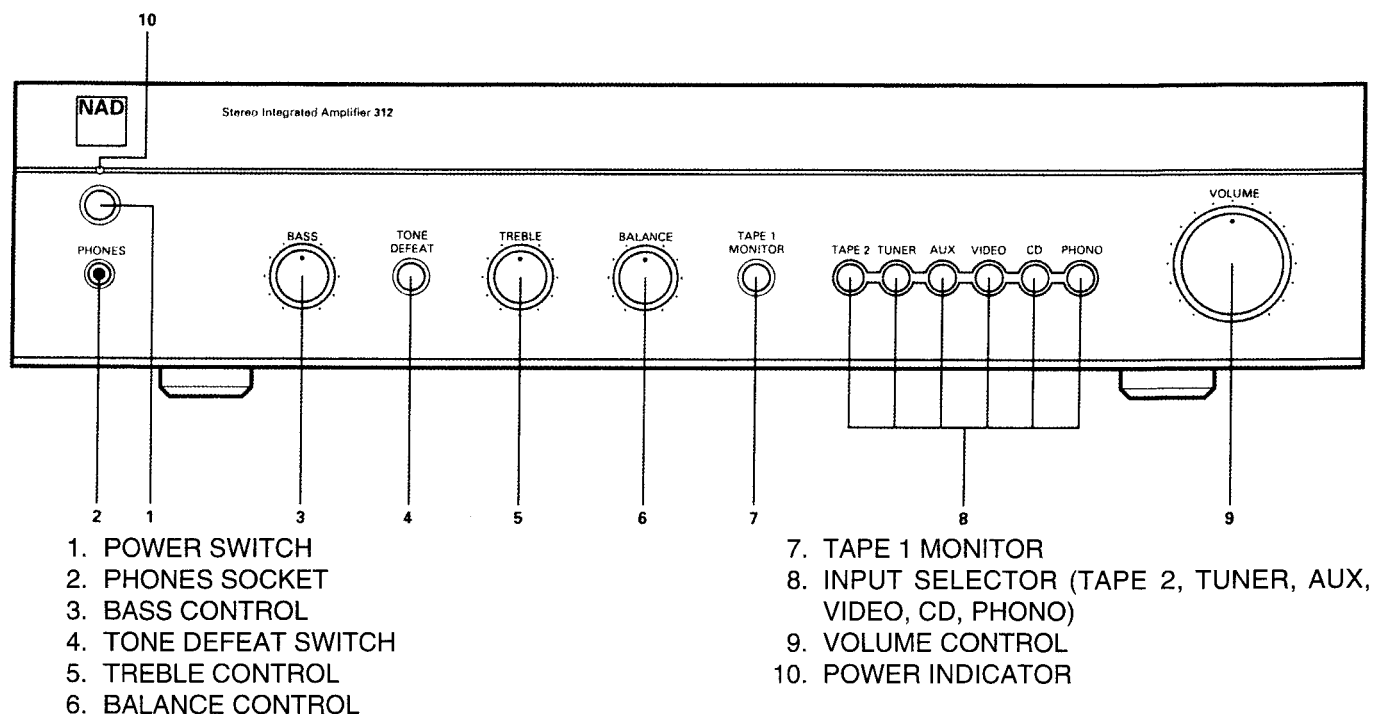
**8 kg (17.6 lb)**

Dimensions (WxHxD)

**435mm x 109mm x 300mm**

# REAR PANEL / FRONT PANEL VIEW

## FRONT PANEL

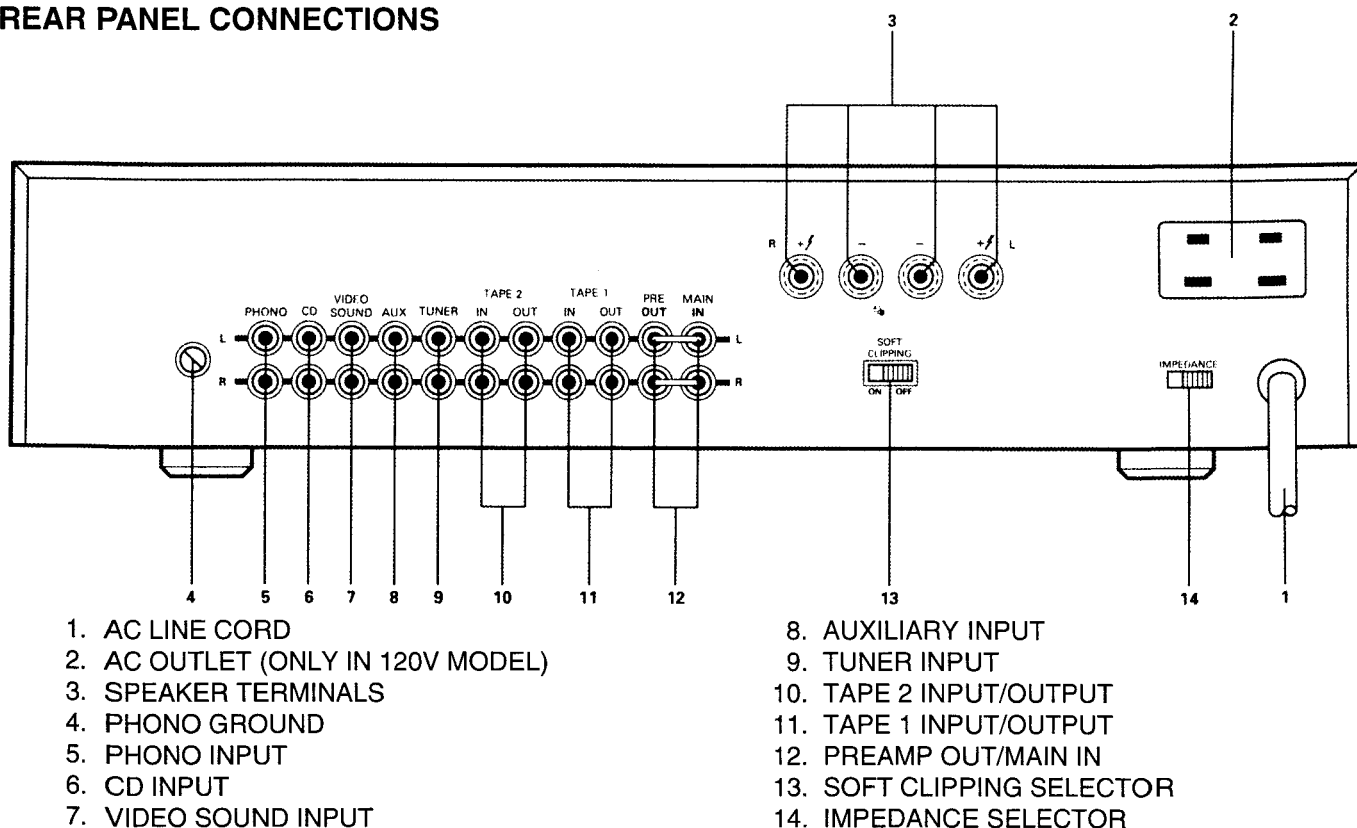


The graphic symbol of a lightning flash with an arrow point within a triangle signifies that there is dangerous voltage within the unit and it poses a hazard to anyone removing the cover to gain access to the interior of the unit. **Only qualified service personnel should make any such attempt.**

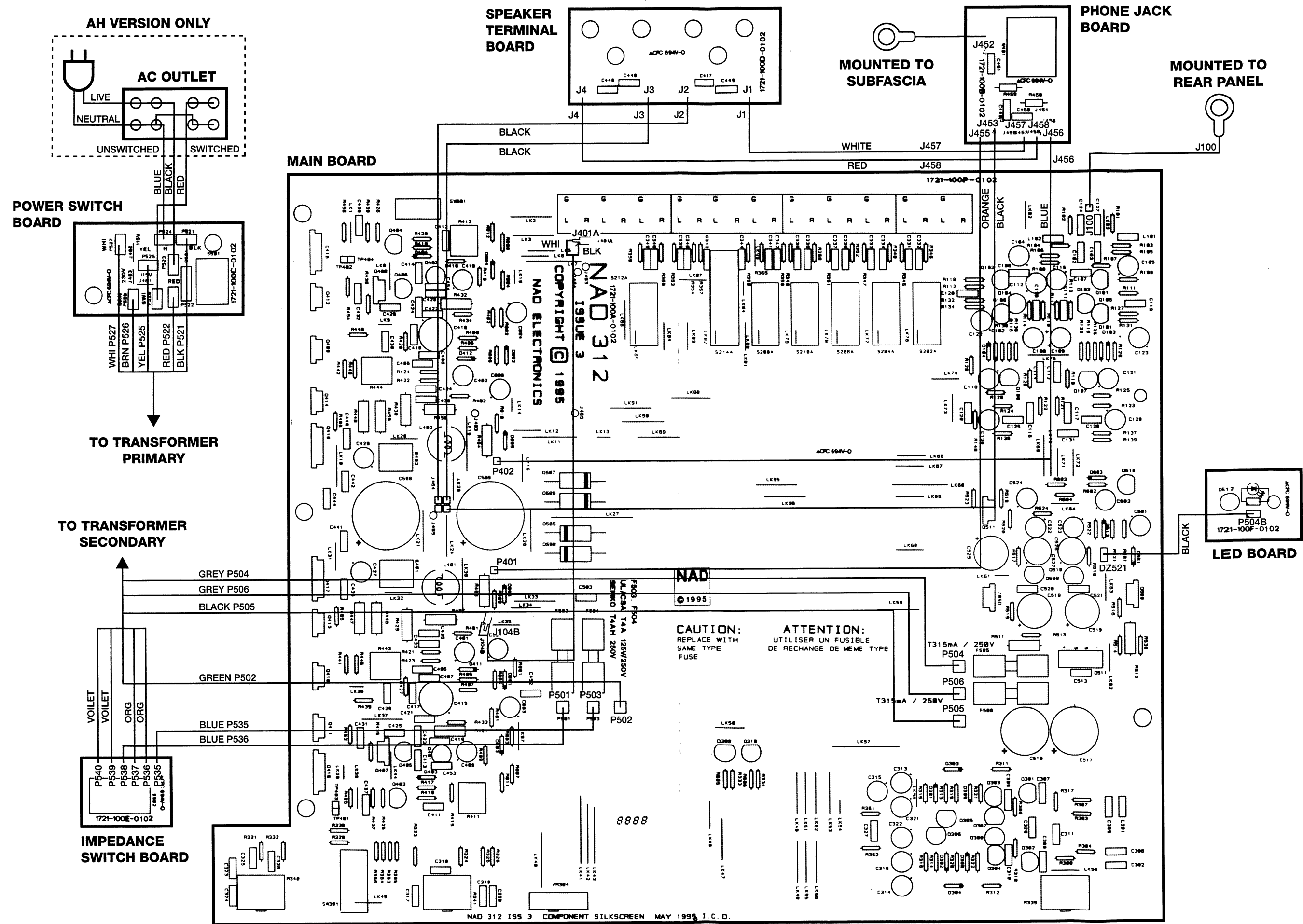


The graphic symbol of an exclamation point within an equilateral triangle warns a user of the device that it is necessary to refer to the instruction manual and its warnings for proper operation of the unit.

## REAR PANEL CONNECTIONS



WIRING DIAGRAM



# DISASSEMBLY INSTRUCTIONS

1. Remove machine screws M4.0 x 6.0 (① to ④) from the side panels. Remove tapping screw 3.0 x 8.0 (⑤) from the back panel. Refer to **Figure No. 1**.

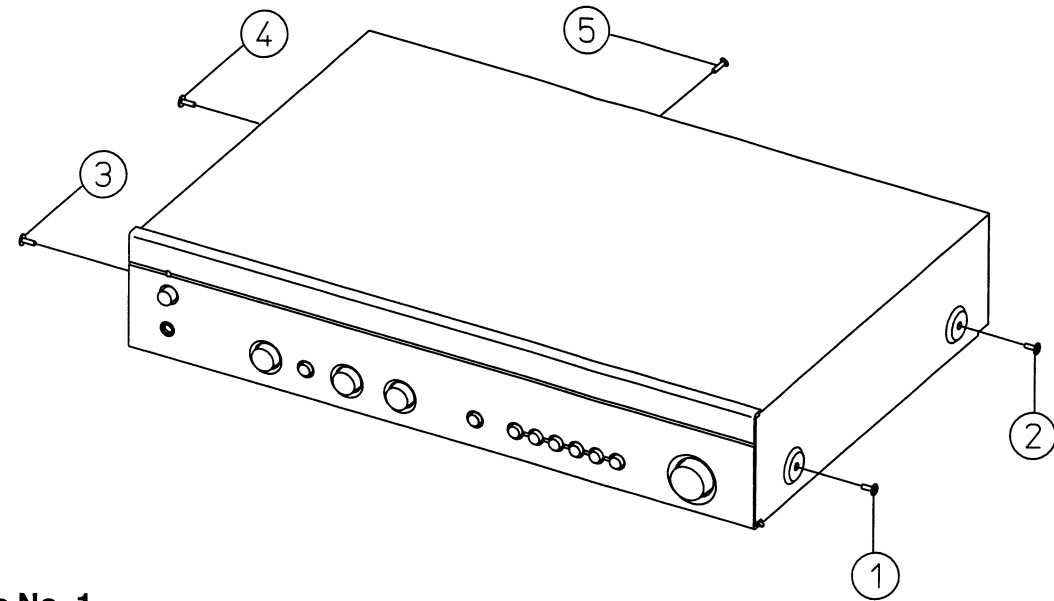


Figure No. 1.

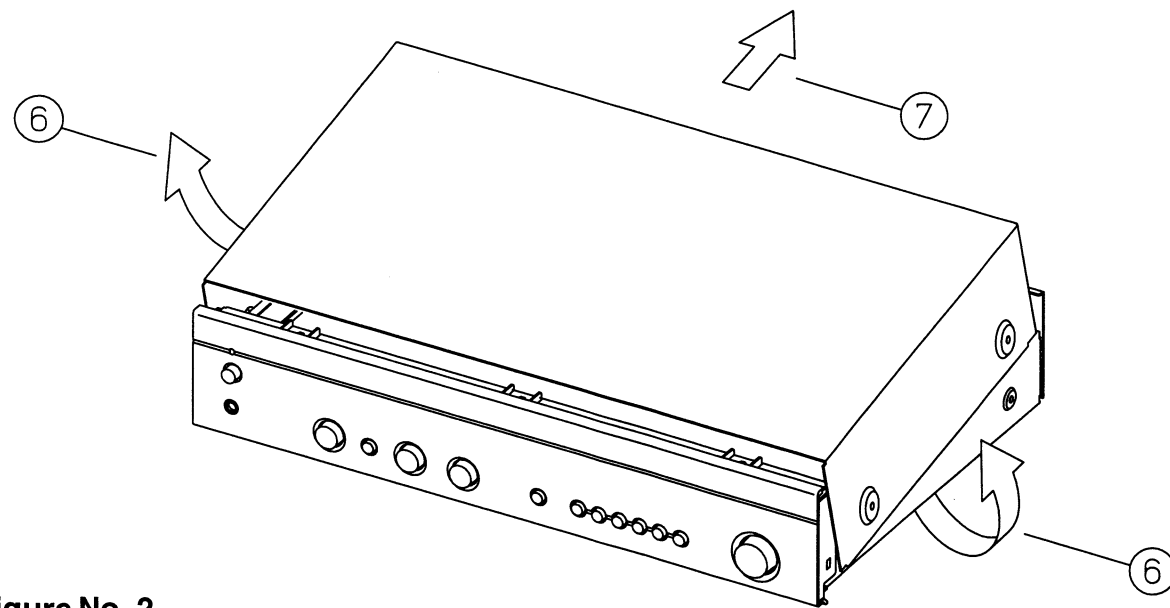


Figure No. 2.

2. Pull both sides of the TOP COVER slightly outwards, tilt approximately 35° and then move in the direction shown in **Figure No. 2**.

# ALIGNMENT PROCEDURES

## IMPORTANT

Speaker impedance switch should be in 8 ohms position while adjusting center voltage and idling current. Reset switch after adjustment procedure is completed. Remove input signal and load.

### A. OUTPUT OFFSET VOLTAGE

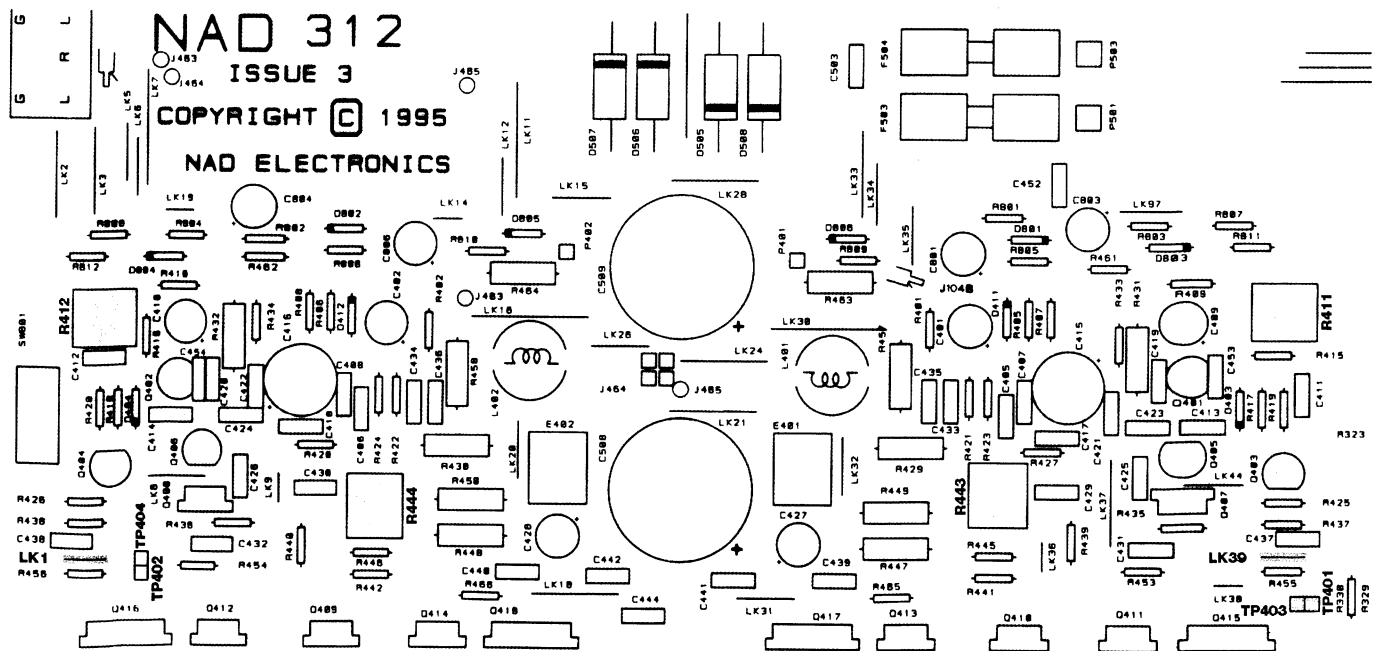
1. Connect a DC millivoltmeter to L channel speaker output terminals.
2. Turn unit on and adjust R411 for  $0 \pm 30$  mV reading on meter.
3. Repeat steps 1 and 2 using R channel speaker terminals and adjusting R412.

### B. IDLING CURRENT

1. Remove solder link between TP401 and TP403 for left channel and between TP402 and TP404 for right channel, or cut LK1 and LK39.
2. Connect a DC millivoltmeter to TP401 and TP403 (across 1 – ohm resistor at collector of output transistor).
3. Adjust R443 for 25–35 mV reading on meter.
4. Repeat steps 2 and 3 using TP402 and TP404 and adjusting R444.
5. Leave power on for at least 5 minutes.

### C. FINAL ADJUSTMENT

1. Repeat output offset voltage and idling current adjustments.
2. WHEN FINISHED, REPLACE SOLDER LINK BETWEEN TP401 AND TP403, AND BETWEEN TP402 AND TP404 OR RECONNECT LK1 AND LK39.



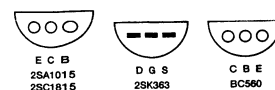
1000



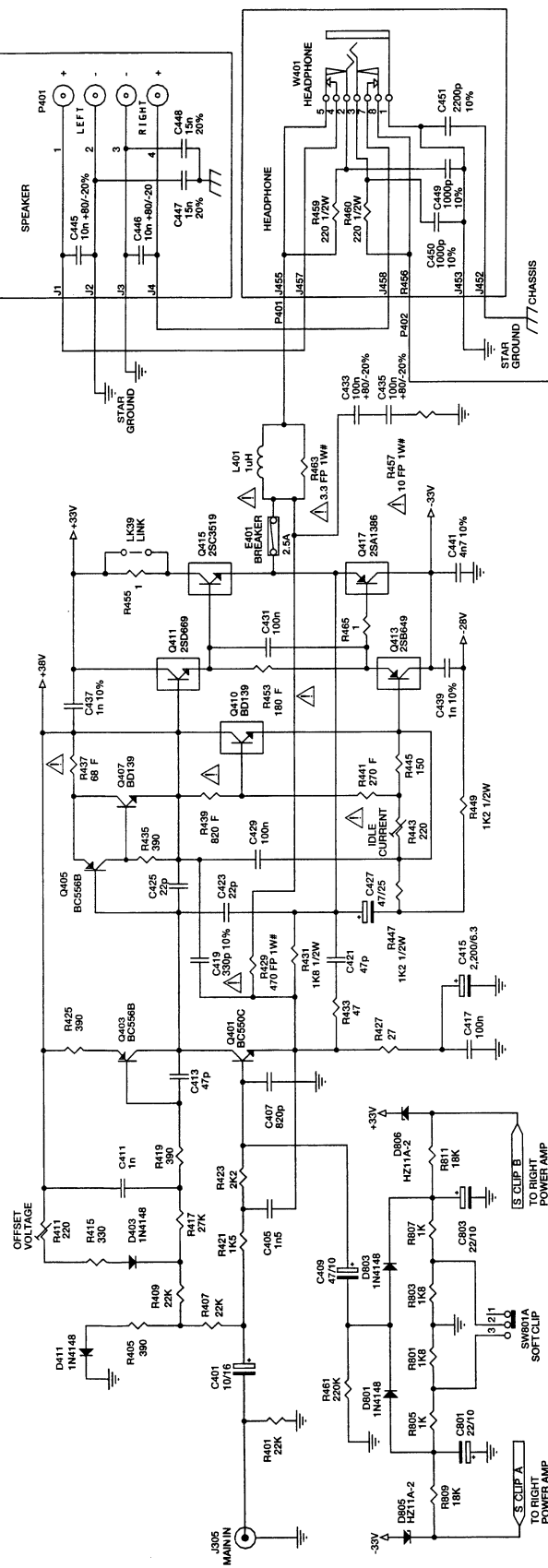
## PREAMP



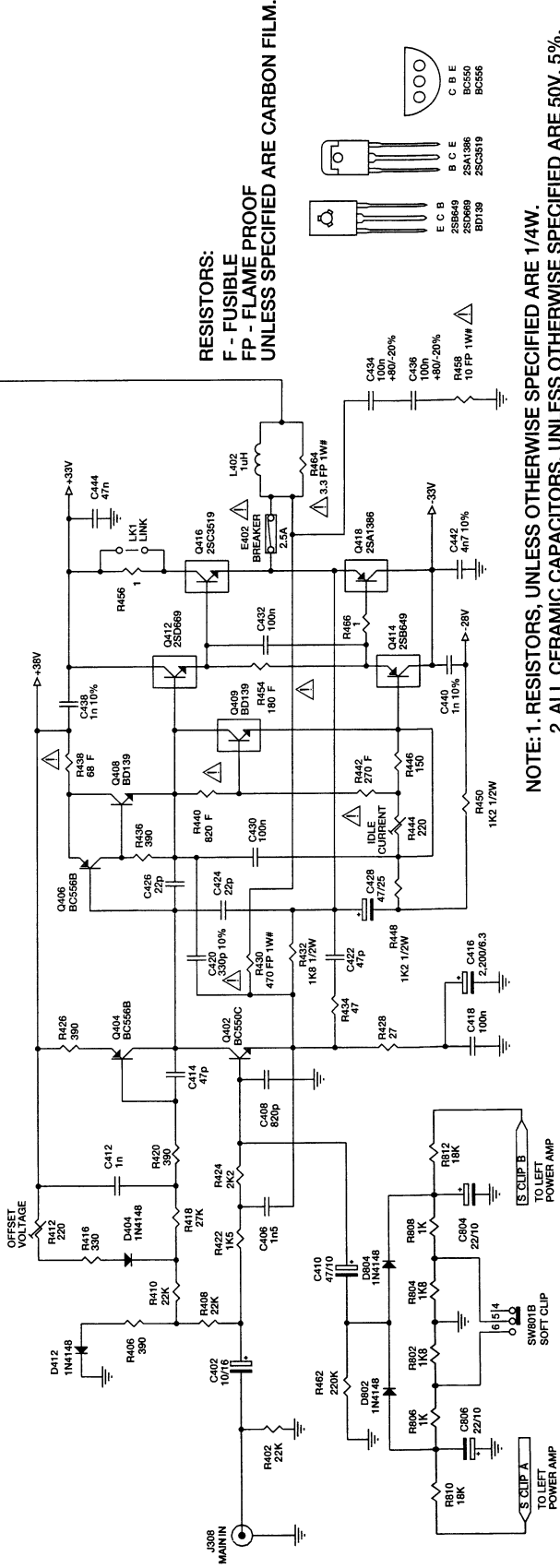
RESISTORS:  
MF - METAL FILM  
UNLESS SPECIFIED  
ARE CARBON FILM.



POWER AMPLIFIER

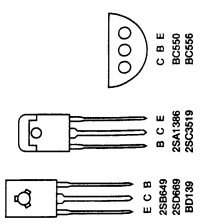


LEFT POWER AMP



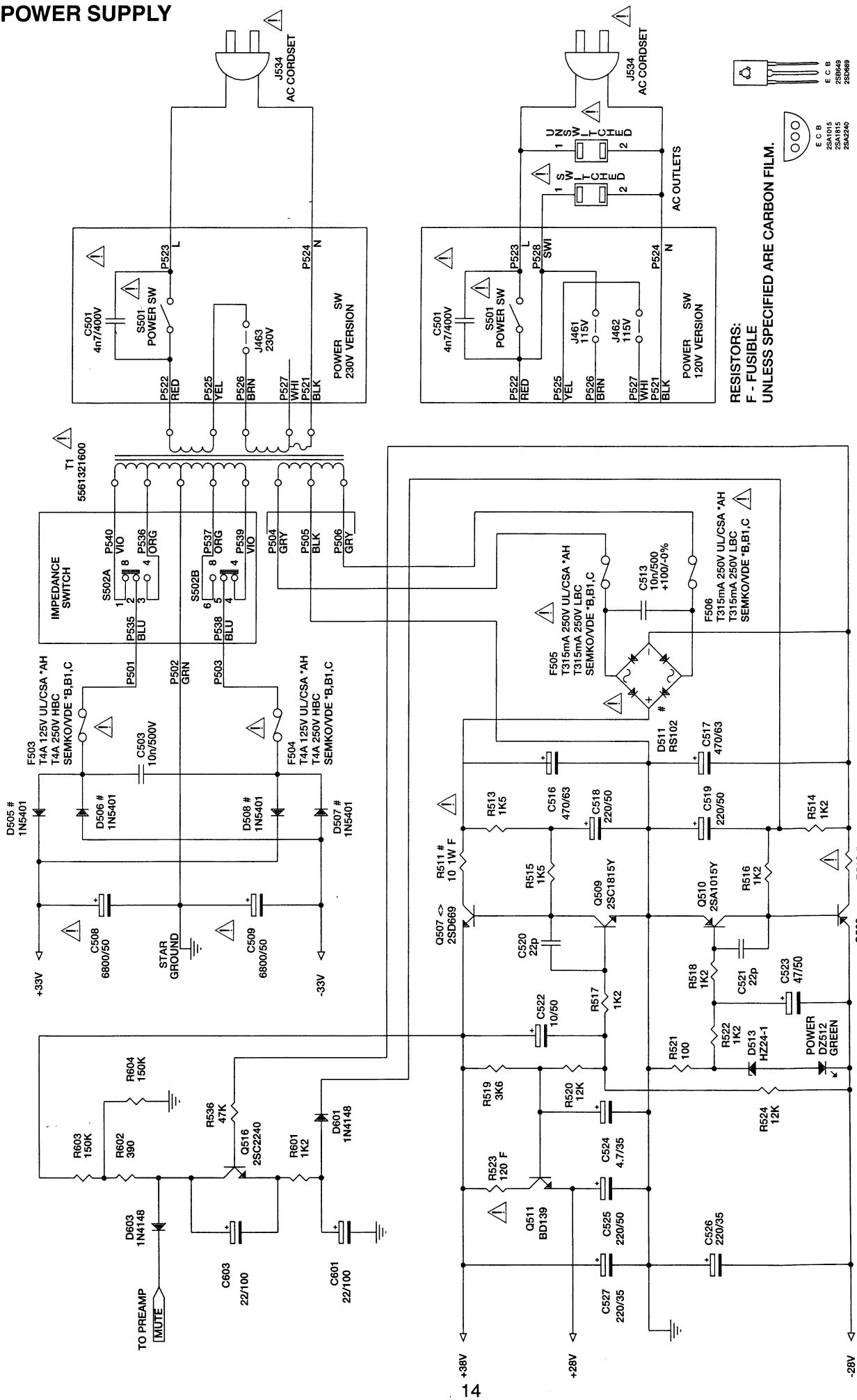
RIGHT POWER AMP

RESISTORS:  
F - FUSIBLE  
FP - FLAME PROOF  
UNLESS SPECIFIED ARE CARBON FILM.



- NOTE: 1. RESISTORS, UNLESS OTHERWISE SPECIFIED ARE 1/4W.  
2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED ARE 50V, 5%.  
3. BLOCKED TRANSISTORS ARE MOUNTED ON MAIN HEATSINK.  
4. COMPONENTS MARKED WITH "Δ" ARE SAFETY CRITICAL PARTS.  
5. COMPONENTS MARKED WITH " # " ARE ELEVATED FROM PCB.

## POWER SUPPLY



NOTE: 1. RESISTORS, UNLESS OTHERWISE SPECIFIED ARE 1/4W.  
2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED ARE 50V, 5%.  
3. COMPONENTS MARKED WITH "△" ARE SAFETY CRITICAL PARTS.  
4. COMPONENTS MARKED WITH " # " ARE ELEVATED FROM PCB.  
5. COMPONENTS MARKED WITH " <> " ARE MOUNTED ON SMALL HEATSINK.

## POWER SUPPLY

1

## EXPLODED VIEW PARTS LIST

| Item                                                                                        | Part No        | Description                      | Qty |
|---------------------------------------------------------------------------------------------|----------------|----------------------------------|-----|
| 0001                                                                                        | N14627711-0    | FASCIA                           | 1   |
| 0002                                                                                        | N14023700-0    | SUBFASCIA                        | 1   |
| 0003                                                                                        | N14023800-0    | CHASSIS                          | 1   |
| 0004                                                                                        | N14023810-0    | BASE COVER                       | 1   |
| 0005*AH                                                                                     | N14023741-1    | REAR PANEL                       | 1   |
| 0005*B,B1,C                                                                                 | 1402-3752-1    | REAR PANEL                       | 1   |
| 0006                                                                                        | N14023840-0    | TOP COVER                        | 1   |
| 0007                                                                                        | N2437510B-0    | DIA 9.5 GLOSS POWER BUTTON       | 1   |
| 0008                                                                                        | N24375601-0    | KNOB 35.0MM (VOLUME)             | 1   |
| 0009                                                                                        | N24375701-1    | KNOB 18.5MM(BASS,TREBLE,BALANCE) | 3   |
| 0010                                                                                        | N41520041-0    | POINTER                          | 4   |
| 0011                                                                                        | N24376101-0    | BUTTON EXTENDER                  | 7   |
| 0012                                                                                        | N24376001-0    | LONG BUTTON 8.0MM                | 8   |
| 0013                                                                                        | N41321181-0    | THUMB SCREW ASSY                 | 1   |
| 0016                                                                                        | 5400-1051-0    | HEATSINK PLATE 28X12X2T          | 2   |
| 0017                                                                                        | N41519371-1    | RUBBER FOOT 14.8MM HIGH          | 4   |
| 0019      | N41519461-0    | STRAIN RELIEF BUSHING            | 1   |
| 0102*AH  | 2103-7701-2    | AC OUTLET                        | 1   |
| 0103*AH  | N41519941-0    | AC OUTLET COVER PLATE            | 1   |
| 0106                                                                                        | 2103-6604-1    | SPK TERMINAL                     | 1   |
| 0120                                                                                        | 2113-0206-0    | 6P RCA R/W NI                    | 3   |
| 0121                                                                                        | 2113-0104-0    | 4P RCA R/W AU                    | 1   |
| 0123*AH  | N70093100-1    | AC CORD                          | 1   |
| 0123*B   | N70095110-1    | AC CORD                          | 1   |
| 0123*B1  | N70091190-1    | AC CORD                          | 1   |
| 0123*C   | N70093110-1    | AC CORD                          | 1   |
| 0201                                                                                        | 2954-3008-3000 | TAPPING 3X8MM B-TITE (BLK.ZN)    | 34  |
| 0204                                                                                        | 2954-3008-0000 | TAPPING 3X8MM B-TITE (YEL.ZN)    | 22  |
| 0206                                                                                        | 2944-3006-3000 | SCREW D3X6 S-TITE BH,BK          | 2   |
| 0207                                                                                        | 2904-3006-0000 | SCREW M3X6                       | 2   |
| 0208                                                                                        | 2842-3367-0    | METAL WASHERID=3.3 OD=6.7        | 4   |
| 0209                                                                                        | 2900-4006-3010 | M4X0.5PX6MM W/FLATWASHER         | 4   |
| 0294                                                                                        | 2950-3006-0000 | 3X6MM PAN HEAD (YEL.ZN)          | 4   |
| 0307                                                                                        | 2900-4006-3010 | M4X0.5PX6MM W/FLAT WASHER        | 4   |
| 0313                                                                                        | 4132-2731-0    | U-SHORTING BAR 14MM              | 2   |
| 0320                                                                                        | 5400-1081-1    | HEAT SINK EXTRUSION              | 2   |
| 0321                                                                                        | 5400-1071-1    | HEAT SINK BAR                    | 1   |
| 0322                                                                                        | 2904-3010-0000 | M3X10MM (YEL.ZN)                 | 4   |
| 0451     | 4152-1031-0    | PWR-PCB COVER PLATE              | 1   |
| 0452                                                                                        | N14024000-0    | SPEAKER GROUND BRACKET           | 1   |
| FH503-6                                                                                     | N41321011-0    | FUSE HOLDER (5X20MM)             | 8   |
| R339                                                                                        | N47503666-0    | VR-VOL 2X20KA W/WASHER & NUT     | 1   |
| R340                                                                                        | N47503676-0    | VR-BASS 2X50KC W/WASHER & NUT    | 1   |
| R341                                                                                        | N47503646-0    | VR-TRE 2X10KC W/WASHER & NUT     | 1   |

| <u>Item</u> | <u>Part No</u> | <u>Description</u>            | <u>Qty</u> |
|-------------|----------------|-------------------------------|------------|
| VR304       | N47503656-0    | VR-BAL 1X10KW W/WASHER & NUT  | 1          |
| S212A       | 5200-3421-0    | SELECT SWITCH                 | 1          |
| S501     △  | 5200-3431-0    | POWER SWITCH W/M3 THREAD      | 1          |
| S502        | N52003031-0-01 | SLIDE SWITCH 5.2T22SS28G10    | 1          |
| SW301       | N52003121-0-01 | 2P2T ALPS SPUN W/O FRAME      | 1          |
| SW801       | N52003131-0-01 | 2P2T SLIDE SW 3.5T22KYGX      | 1          |
| T001     △  | N18062120-1    | TRANSFORMER W/M4H/L-WIRE      | 1          |
| W401        | 2113-1011-0    | PHONE JACK 6312-03-070 W/CLIP | 1          |

**NOTE :** - The components identified by △ mark are critical for risk of fire and electrical shock.  
Replace only with part number specified.

- <\*AH > : USA, Canadian model only.
- <\*B > : UK model only.
- <\*B1 > : Australian model only.
- <\*C > : European model only.

# ELECTRICAL PARTS LIST

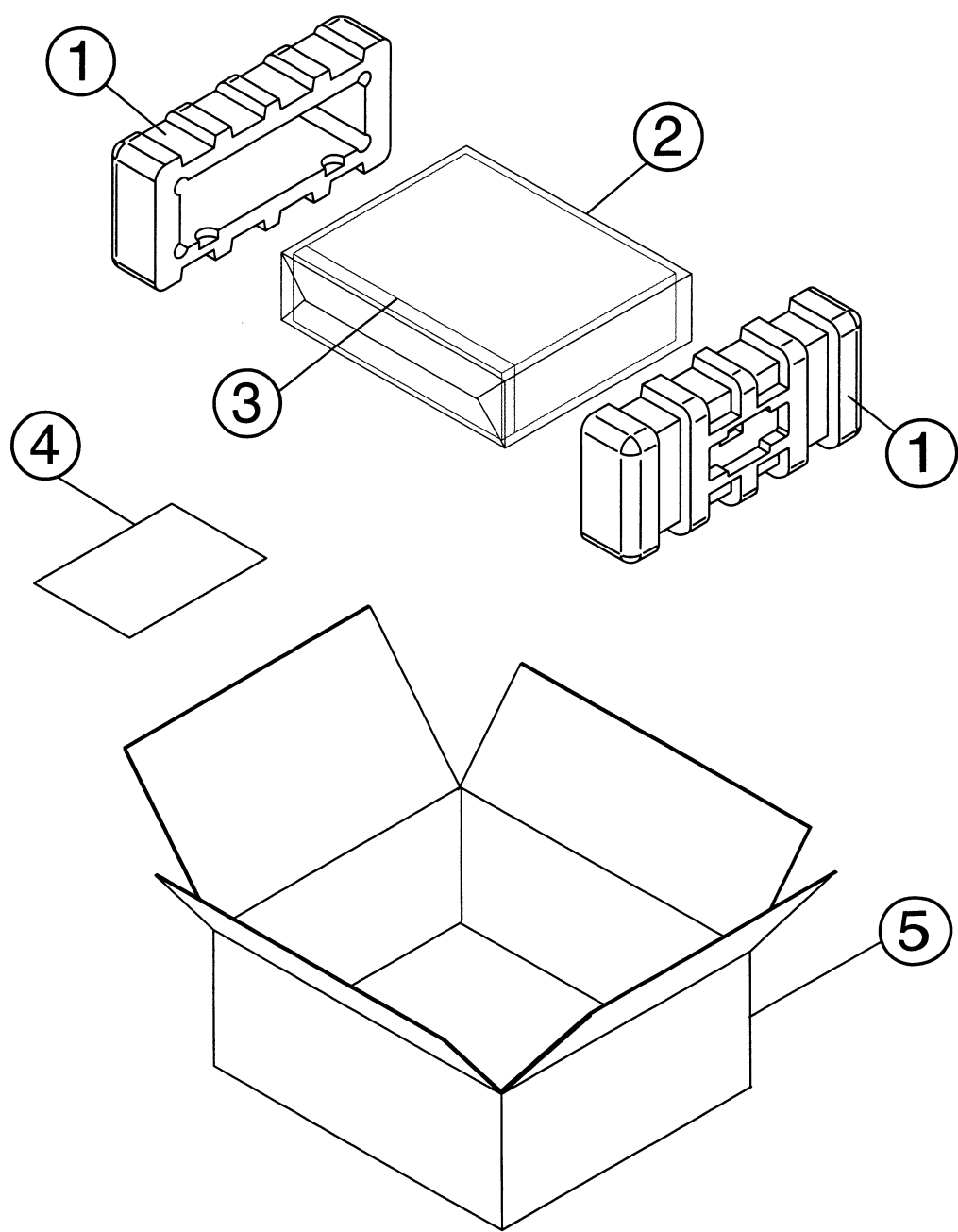
| Reference No        | Part Number    | Description                     |
|---------------------|----------------|---------------------------------|
| <b>PC BOARD</b>     | MI-21100-01-S  | 312 MAIN ASSEMBLY               |
| <b>CAPACITORS</b>   |                |                                 |
| C104-C105           | 157F-106M-5-IU | CE 50V 10µF 20%                 |
| C108-C109           | 157E-476M-5-IU | CE 25V 47µF 20%                 |
| C112                | 157B-227M-5-KW | CE 6.3V 220µF 20%               |
| C113-C114           | 153F-243J-5-OW | CM 50V 0.024µF 5%               |
| C115                | 157B-227M-5-KW | CE 6.3V 220µF 20%               |
| C116-C117           | 153F-682J-5-JQ | CM 50V 6800pF 5%                |
| C118, C121          | 157E-476M-5-IU | CE 25V 47µF 20%                 |
| C122-C123           | 157B-227M-5-KW | CE 6.3V 220µF 20%               |
| C126, C129          | 157F-106M-5-IU | CE 50V 10µF 20%                 |
| C128-C131           | 153F-222J-5-KW | CM 50V 2200pF 5%                |
| C301-C302           | 153I-474J-9-NO | CM 63V 0.47µF 5%                |
| C313-C314           | 157E-476M-5-IU | CE 25V 47µF 20%                 |
| C315-C316           | 157E-107M-5-KW | CE 25V 100µF 20%                |
| C317-C318           | 153F-183J-5-LW | CM 50V 0.018µF 5%               |
| C319-C320           | 153F-104J-5-SY | CM 50V 0.1µF 5%                 |
| C321-C322           | 157E-476M-5-IU | CE 25V 47µF 20%                 |
| C323-C324           | 153F-823J-5-SY | CM 50V 0.082µF 5%               |
| C325-C326           | 153I-474J-9-NO | CM 63V 0.47µF 5%                |
| C401-C402           | 157D-106M-5-IU | CE 16V 10µF 20%                 |
| C405-C406           | 153F-152J-5-KW | CM 50V 1500pF 5%                |
| C407-C408           | 153F-821J-5-HS | CM 50V 820pF 5%                 |
| C409-C410           | 157C-476M-5-IU | CE 10V 47µF 20%                 |
| C411-C412           | 153F-102J-5-IM | CM 50V 1000pF 5%                |
| C415-C416           | 157B-228M-5-Z@ | CE 6.3V 2200µF 20%              |
| C417-C418           | 153F-104J-5-SY | CM 50V 0.1µF 5%                 |
| C427-C428           | 157E-476M-5-IU | CE 25V 47µF 20%                 |
| C429-C432           | 153F-104J-5-SY | CM 50V 0.1µF 5%                 |
| C501                | N89100049-0    | CAP400V 4700pF DE7150F472MVA1KC |
| C508-C509           | N89100029-0    | CE 50V 6800µF 20%               |
| C516-C517           | 157I-477M-5-Y@ | CE 63V 470µF 20%                |
| C518-C519           | 157F-227M-5-S5 | CE 50V 220µF 20%                |
| C522                | 157F-106M-5-IU | CE 50V 10µF 20%                 |
| C523                | N157F476M-5-PV | CE 50V 47µF 20%                 |
| C524                | N157Q476M-5-LU | CE 35V 47µF 20%                 |
| C525-C527           | 157F-227M-5-S5 | CE 50V 220µF 20%                |
| C601, C603          | N157H226M-5-PV | CE 100V 22µF 20%                |
| C801,C803-C804,C806 | 157C-226M-5-IU | CE 10V 22µF 20%                 |
| <b>DIODES</b>       |                |                                 |
| D101-D104           | 4804-1480-2    | DIODE 1N4148                    |
| D301-D306           | 4804-1480-2    | DIODE 1N4148                    |
| D403-D404           | 4804-1480-2    | DIODE 1N4148                    |
| D411-D412           | 4804-1480-2    | DIODE 1N4148                    |
| D505-D508           | N48054010-1    | DIODE 1N5401 100V 3A            |
| D511                | N48400470-0    | BRIDGE RECTIFIER RS102 100V 1A  |
| D512                | N37002489-G    | LED 3MM GREEN                   |
| D513                | 4840-0790-0    | DZ 1/2W 22.9-24 HZ24V-1         |
| D601,D603           | 4804-1480-2    | DIODE 1N4148                    |
| D801-D804           | 4804-1480-2    | DIODE 1N4148                    |
| D805-D806           | 4837-8A20-2    | DZ 1/2W 9.7-10.1                |

| <b>Reference No</b>       | <b>Part Number</b> | <b>Description</b>             |
|---------------------------|--------------------|--------------------------------|
| <b>BREAKERS</b>           |                    |                                |
| E401-E402      △          | 8910-0088-0        | BREAKER 2.5A A-25              |
| <b>INDUCTORS</b>          |                    |                                |
| L101-L102                 | N18030013-0        | TOROID INDUCTOR 3.7MH +-20%    |
| L401-L402                 | 1804-0540-0        | SPRING COIL 1μH                |
| <b>TRANSISTORS</b>        |                    |                                |
| Q101-Q104                 | N48600710-5        | TR 2SC1815L GR                 |
| Q105-Q108                 | N48600660-5        | TR 2SA1015GR                   |
| Q301-Q301                 | N485C560C-5        | TR BC560C                      |
| Q303-Q306                 | N4851815Y-5        | TR 2SC1815-Y HFE 120-240       |
| Q307-Q308                 | N4851015Y-5        | TR 2SA1015-Y HFE 100-200       |
| Q309-Q310                 | N485363BL-5        | TR N-JEET 2SK-363BL            |
| Q401-Q402                 | N485C550C-5        | TR BC550C                      |
| Q403-Q406                 | N485C556B-5        | TR BC556B                      |
| Q407-Q410                 | N485D1390-5        | TR BD139-10 PHILIPS HFE 63-160 |
| Q411-Q413                 | N485669AC-5        | TR 2SD669A-C                   |
| Q413-Q414                 | N485649AC-5        | TR 2SB649A-C HFE 100-200       |
| Q415-Q416                 | N48600730-5        | TR 2SC3519 (0,P,Y)             |
| Q417-Q418                 | N48600690-5        | TR 2SA1386 (0,P,Y)             |
| Q507                      | N485669AC-5        | TR 2SD669A-C                   |
| Q508                      | N485649AC-5        | TR 2SB649A-C HFE 100-200       |
| Q509                      | N4851815Y-5        | TR 2SC1815-Y HFE 120-240       |
| Q510                      | N4851015Y-5        | TR 2SA1015-Y HFE 100-200       |
| Q511                      | N485D1390-5        | TR BD139-10 PHILIPS HFE 63-160 |
| Q516                      | N485240GR-5        | TR 2SC2240GR                   |
| <b>RESISTORS</b>          |                    |                                |
| R107-R108                 | 4715-563C-2        | RMF 56k Ohm 1/4W 2%            |
| R117-R118                 | 4715-221C-2        | RMF 220 Ohm 1/4W 2%            |
| R119-R120                 | 4715-134C-2        | RMF 130k Ohm 1/4W 2%           |
| R121-R122                 | 4715-113C-2        | RMF 11k Ohm 1/4W 2%            |
| R123-R124                 | 4715-181C-2        | RMF 180 Ohm 1/4W 2%            |
| R329-R330                 | 4715-392C-2        | RMF 3.9k Ohm 1/4W 2%           |
| R331-R332                 | 4715-681C-2        | RMF 680 Ohm 1/4W 2%            |
| R361-R362                 | 4715-272C-2        | RMF 2.7k Ohm 1/4W 2%           |
| R363-R364                 | 4715-681C-2        | RMF 680 Ohm 1/4W 2%            |
| R365-R366                 | 4715-392C-2        | RMF 3.9k Ohm 1/4W 2%           |
| R429-R430      △          | 4718-471J-1-X      | RFP 470 Ohm 1W 5%              |
| R437-R438      △          | 4715-680J-2-F      | RFU 68 Ohm 1/4W 5%             |
| R439-R440      △          | 4715-821J-2-F      | RFU 820 Ohm 1/4W 5%            |
| R441-R442      △          | 4715-271J-2-F      | RFU 270 Ohm 1/4W 5%            |
| R453-R454      △          | 4715-181J-2-F      | RFU 180 Ohm 1/4W 5%            |
| R457-R458      △          | 4718-100J-L-P      | RFP 10 Ohm 1W 5%               |
| R463-R464      △          | 4718-3R3J-1-X      | RFP 3.3 Ohm 1W 5%              |
| R511              △       | N4718100J-L-F      | RFU 10 Ohm 1W 5%               |
| R512              △       | 4719-101J-L-F      | RFU 100 Ohm 2W 5%              |
| R523              △       | 4715-121J-2-F      | RFU 120 Ohm 1/4W 5%            |
| <b>VARIABLE RESISTORS</b> |                    |                                |
| R411-R412                 | 4756-2216-3-06     | SVR 220 H3 7X7.6               |
| R443-R444                 | 4756-2216-3-06     | SVR 220 H3 7X7.6               |

| <u>Reference No</u>     | <u>Part Number</u> | <u>Description</u>                       |
|-------------------------|--------------------|------------------------------------------|
| <b>FUSES</b>            |                    |                                          |
| F503-F504*AH      △     | 5120-0019-0        | FUSE 4A 125V SLOW BLOW LBC (UL/CSA)      |
| F503-F504*B,B1,C      △ | 5120-0017-0        | FUSE 4A 250V TIME LAG HBC (SEMKO/VDE)    |
| F505-F506*AH      △     | 5120-0026-0        | FUSE 315mA 250V TIME LAG LBC (UL/CSA)    |
| F505-F506*B,B1,C      △ | 5120-0027-0        | FUSE 315mA 250V TIME LAG LBC (SEMKO/VDE) |

- NOTE :** – The components identified by △ mark are critical for risk of fire and electrical shock.  
Replace only with part number specified.
- <\*AH> : USA, Canadian model only.
  - <\*B> : UK model only.
  - <\*B1> : Australian model only.
  - <\*C> : European model only.
  - Capacitors : CM-Mylar, CE-Electrolytic.
  - Resistors : RMF-Metal Film, RFU-Fusible, RFP-Flame Proof.

PACKING DIAGRAM



PACKING LIST

| <u>Item</u> | <u>Part No</u> | <u>Description</u> | <u>Qty</u> |
|-------------|----------------|--------------------|------------|
| 1           | 1490-1843-1    | POLYFOAM END CAP   | 2          |
| 2           | N14971332-1    | UNIT POLYBAG       | 1          |
| 3           | N14971442-0    | FASCIA COVER       | 1          |
| 4           | N43013569-0    | INSTRUCTION MANUAL | 1          |
| 5           | N14763901-0    | CARTON BOX         | 1          |

# SERVICE MANUAL

Proprietary information for servicing purposes only. The information herein may not be used commercially without the prior written agreement of NAD Electronics Ltd., London, England.

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## 312 STEREO INTEGRATED AMPLIFIER

**NAD ELECTRONICS**  
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